

the RARS

~~Exciter~~

Raleigh Amateur Radio Society



Worldwide Friendship

June 2000

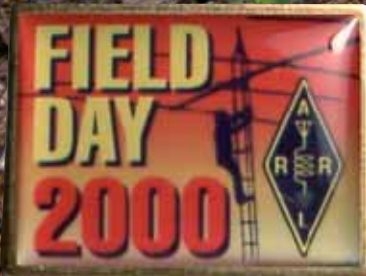
Number 356

Fox Hunt Fun!

see page 6

Membership
Renewal Form
Included In This
Issue

Field Day June 24/25



see page 3

Next RARS Meeting: Tuesday, June 6

The Exciter

The **Exciter** is the monthly newsletter of the Raleigh Amateur Radio Society. It is available in both printed and electronic form. The printed version is mailed to members just before each club meeting. The electronic form, in Adobe Acrobat PDF format, is e-mailed about a week earlier.

We solicit both articles and advertising. The deadline for submissions is the 15th of the prior month. Contact the Editor.

The views contained in the Exciter are those of the individual authors, and are not necessarily the views of the Editor, or the Raleigh Amateur Radio Society.

The Raleigh Amateur Radio Society

The Raleigh Amateur Radio Society, Inc. (RARS) was founded in 1969 and continues to serve and support the Amateur Radio community in the greater Triangle area. In 1999, we incorporated a new RARS, and obtained 501(c)(3) Non-Profit tax status.

The objectives of the club are to promote worldwide friendship through Amateur Radio; to be of public service by providing radio communications in times of disaster, emergency, or civic need; to educate members in radio technique; and to provide training classes to assist in obtaining Amateur Radio licenses.

Anyone interested in Amateur Radio is eligible to apply for membership. Dues for regular licensed amateurs are \$18.00 per year (from July 1 through June 30). Additional immediate family members pay \$5.00 each per year. Dues for licensed amateurs older than 59 or younger than 16 are \$12.00 per year. Dues for non-licensed Associate members are \$9.00 per year.

Applications for membership may be obtained from the treasurer, or the RARS web site (www.rars.org).

Officers

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Info

Repeaters:

145.13
146.64
224.64
444.525 (88.5 PL)
444.95 (88.5 PL)

Web Site:

<http://www.rars.org>

President's Corner

Jack Ritter WØUCE

Field Day Then and Now

What is Field Day? Ask ten hams and you will most likely receive ten different responses. Ask me and you will receive a very biased opinion. Simply stated, Field Day is the best possible way to build ham radio friendships and memories that last a lifetime. OK, so ol' UCE is hooked and has been since my first FD in 1953. There is not another event that brings fellow hams closer together through interactivity and cooperation than FD aside from providing communications in support of an actual disaster. Hopefully we can forego the real thing and simply enjoy Field Day in order to be prepared and well trained should the need arise. Everyone has FD memories, good, bad or indifferent. Mine happen to all be good and I would like to share some UCE FD experiences with you.

Back Then: My first FD took place in an abandoned two-room country school house near Grinnell, Iowa. I was the newest member of the Central Iowa Amateur Radio Club and had recently dropped the N from my call by passing the General Class Exam. That is another story - can you imagine how a 13 year old kid can be intimidated by the stern, never smiling FCC examiner at the Federal Building in Des Moines peering down at me over glasses perched on the end of his nose? I remember him yet today. Gosh, I had made the fifty mile trip to that huge city only once before in my life under the close supervision of my parents.

Back to FD 1953 - The AM phone station was set up in one room, the CW station in the other. If I recall correctly, the AM crew used a Viking I transmitter with outboard VFO an SX-71 Receiver with long wire receive antenna and a Center fed Zepp tuned with a Viking Match Box for transmit. I can recall the CW station like it was yesterday. It belonged to Dale WØGJT and yours truly was awed to, for the first time, see a Collins 75A-1 Receiver, 32V-1 Transmitter, Johnson Match Box, Johnson Tube Type TR Switch and a 135 Ft. Center Fed Zepp. My fingers twitched in anticipation as I clutched my most prized possession to my chest; a used Vibroplex Lightning Bug safely nestled in it's case. I had saved my allowance (\$1.00 a week), Christmas and birthday money, shoveled walks, washed cars and mowed lawns for six months to save the \$15.00 required to buy this treasure from Andy WØAQL. Now it was mine, all mine, and hopefully I would actually be using it to key a Collins Station.

"What? How can this be? I don't understand." A friendly but firm "old timer" broke my bubble when he advised me "First time FD participants don't operate!" No "Grasshopper," you gather firewood, help put up antennas, look after the needs of the "Pros" like bringing coffee, help fill the generator, and if you prove you can copy, you might, just might get to log. Logging in those days was on sheets of legal size paper with carefully drawn columns labeled 1-Ø. After all, back then there were just W and K calls to worry about so you simply neatly printed, for example, W9VER in the 9 column.

Fighting back the tears I carefully wrapped my bug in my jacket and safely placed it on the floor in the corner of the school room. I was so very fortunate to have parents that taught me all good things come to those who wait and are willing to work for them, never quit and above all, keep your mouth shut and listen. Still facing the corner, I wiped away a tear running down my cheek and became determined to prove this kid will show em' he can copy if they just give me the chance to log.

continued on next page

Field Day Tips: *Ready To Go!*

At this time, it looks like our biggest needs are Natural Power, Satellite, and Digital. If you would like to try one of these activities, but have never done such a thing, give me a call, and I'll give you ideas on how you can do it.

And now, a few last minute tips on preparation and operating:

- 1.) Practice with your logging program a few days before the event, so that if you have trouble, you can iron out the rough spots.
- 2.) Make a cheat sheet showing the keystrokes to change band, mode, etc. in case it inadvertently gets changed during your shift.
- 3.) Set your computer to UTC time so the log comes out correctly.
- 4.) Make sure you have the latest "Sections" file. There should be 80 sections total, with the most recent addition being West Central Florida. If you have even less than 79, check for Northern New York, and Newfoundland-Labrador, other recently added Sections.
- 5.) If you're working phone, Say "North Carolina" for the Section. It's much easier to understand than NC or November Charlie.



*Jeff Wittich AC4ZO
Field Day Chairman*

- 6.) Watch the band edges. Official Observers are out in force looking for this. It's not the end of the world if we get a notice, but it's better if we don't.
- 7.) Generally speaking, rigs of the ICOM 706 and Kenwood TS-50 class do not hear as well in a Field Day environment as the traditional big boxes because they have fewer tuned circuits. Also, they tend to cause more of the broad-banded phase noise that interferes with the other stations. If you must use one of these rigs, you may encounter worse interference from the other stations.
- 8.) If your rig has a bandscope, please please **PLEASE** do not rely on the scope to do your hearing for you. I recently witnessed an operator tune across numerous stations... just passed them over, because he could not see them on the scope. These stations were plenty workable too. On the lower bands like 75 meters, there's so much noise that it's hard to pick signals out on the scope. On the quieter bands like 15 and 10 meters, many workable signals may not show up at all. I recommend turning it off for Field Day.
- 9.) Diet Dr. Pepper is the drink of champions. And it's a natural with Pop Tarts.

Attention Band Captains: Do you think we need to call a meeting before the event to iron out station placement and stuff? If so, say so on the RARS-I list, and we'll plan it. Most of the Captains are veterans, so maybe this isn't necessary this time.

Attention New Hams: Pardon me if this all sounds too serious. It's very easy to get caught up in the excitement surrounding this event. If you've never attended a Field Day event, please try to

continued on page 9

President's Corner

continued from previous page

And after hours of grunt work and making sure I smiled at every one who sat down to operate in hopeful anticipation they would ask me to log, finally they asked and log I did - first for Dale WØGJT, then Russ WØBDR, a visually handicapped CW traffic operator who could send with such beautiful technique that I could not imagine, and then for the Grand Master himself, Bob WØNWX. Today Bob is 80 years young, and is now VP2VI.

Back then he was the most recognized and respected DX operator in the world. He made the first ever DX Expedition fifty years ago, is a past ARRL President and above all he was my Elmer.

Bob was about to sit down and operate, he glanced my way and said "Jack, would you like to log for me?" Now more nervous than ever, the new kid carefully logged every call, then after running up the score one station after another, Bob missed one and the kid said "WØMM, 2A MO." Smiling, Bob said, "Good job. Would you like to operate?"

I couldn't believe my ears, the Master actually asked me to operate. Almost knocking over the chair, I leaped for my prize possession, carefully pulled it from its case and plugged in. Hand shaking I managed to send FD FD WØTIU WØTIU K.



*The "kid from Iowa" makes the 1000th contact
at the RARS 1999 FD 40 Meter CW station*

Immediately W9VER responded, I sent 2A IA, they responded 2A IL. The kid did it, he made his first ever FD contact: I will never forget Bob or W9VER.

In between: Over the years I have many great FD memories. At my first NC FD in 1992 I met Boat Anchor Bob NA4G, who became an immediate friend. I have since had the privilege of operating with Bob K4MC, Neal N4HAF and Bert N4CW, all masters of the art. Last year has special memories as well, W4D broke 1,000 QSO's on CW and I shared operating with the regular gang and also now have a new friend, Dan N3ND, who is a great CW operator.

Now: What will FD 2000 bring? For sure, good friends, great fellowship, lots of fun and more good memories. My two favorite hobbies are working CW and cooking. Hopefully I won't have to make another dreaded international business trip in June and can once again enjoy this fun filled event called Field Day.

What memories will you have after FD this year? The answer is simple: "Whatever you want them to be and make them." Join the fun and fellowship and while we all hope our skills, talents and gear won't be called upon in a real disaster, we will be ready and willing should it be necessary.

While the kid from Iowa is long gone, perhaps I will once again be fortunate and asked to do something special at FD. Maybe this year someone will ask "the ol' man" to cook for RARS FD 2000. What a way to spend a weekend, cooking and working CW with great friends, it just doesn't get any better than that. ■

DUES are Due!

It's money-grubbing time again at your friendly local radio club. Membership renewal is due from all club members (except you lifers) as of June 30. Renew early and beat the rush.

A customized, personalized renewal form is included with this **Exciter** (electronic **Exciter** subscribers will get their renewal form as a separate PDF file e-mail attachment from the treasurer).

Please complete this form and return it to the treasurer as you renew! Check your address, phone number, etc. to help keep our database up to date.

The easiest way to renew is in person at the club meeting, but *please bring the pre-printed form with you*. You can also mail it to Treasurer N4YTO (his address will be on the form). ■

PCRN Needs Support, Too!

Gary Pearce KN4AQ
Frank Lynch W4FAL

While you've got your

checkbook out... the message below about the **Piedmont Coastal Repeater Network (PCRN)** was posted on the Cary ARC mailing list by Frank Lynch W4FAL. I thought that RARS members would be quite interested in it as well.

Frank mentions the Cary club members as major contributors to PCRN. I don't have a clue about how many RARS members are in PCRN, but I would like to suggest it to anyone operating VHF-FM in the area, whether you use the network or PCRN repeaters regularly or not.

Given the coverage of PCRN repeaters and the multi-state network, their ARES and SKYWARN support, how many hams would you guess are PCRN contributors (\$15/year)?

- A: Several hundred B: Close to a thousand
C: Two thousand D: I only operate 75 meter AM

It's time to shake things up again!

As the self appointed web master and member database massager for PCRN, I just finished building an Excel database from member data supplied by Ed, AB4S (thanks Ed).

First a word of thanks is in order to members of the Cary Club. Of the 111 current paid up members, CARC is a major leader in supporting PCRN. A very large percentage of our membership supports PCRN, including many that I seldom even hear use the machines. Most of the folks in our club have been around for a while and have some idea of what it costs to keep even a single repeater at a good site running (not to mention the huge network that Danny and company have built over the years). While CARC has provided good support, we're a small club. Even if everyone in the club donated \$15 bucks we probably couldn't pay for a duplexer, repeater, controller, hardline, and an antenna. That's another reason to consider ourselves fortunate to have someone around like Danny, Mike, Norbert, Bill, Ed, Bob, and many, many others that have helped make PCRN what it is today.

I did some statistics from the database and found that a breakdown of local city membership looks something like this:

Raleigh	26	Garner	3	Zebulon	1
Cary	20	Knightdale	0	Durham	3
Apex	1	Wendell	1	Chapel Hill	2

New Membership Cards

Denyse Walter KG4CXR
Membership Chairman

It's a new year for the club (our fiscal year runs from July to June), so Happy New Year!

I'll need members to email me their names and call signs for the new 2000-2001 membership cards. You must have your membership paid for the new year to our treasurer David Fix N4YTO. I didn't keep the database from last year, a mistake not to be done again.

If you can't attend a meeting, please email your name and address and I'll send you the card.

Email: KG4CXR@aol.com

Is that your final answer?

I'm sorry. You should have used a lifeline. It's **111**. RARS is more than twice as big.

And how many of those are from the Triangle area, home of 146.88 (the PCRN flagship repeater), 145.39 (the former 147.15 machine), the new 147.135, and well within coverage of the Broadway 147.105 repeaters?

57. Fifty-seven. A good number for catsup, but pathetic for support of such a repeater network.

Well, PCRN doesn't beat its drum very much. Until W4FAL came along and made some noise, I had no idea how many members they did (or didn't) have. I would have guessed close to a thousand... and you could have talked me into more. Most of the money for the repeaters comes from just a few people. But I'll stop telling the story now, and let Frank do it.... KN4AQ

This is pathetic! I know there's a lot more than 57 people in the Triangle area that regularly use the machines.

There's an updated member list on the PCRN webpage, an updated Repeater Listing (less the linking codes), and a new newsletter. When you read the newsletter, you'll see that PCRN needs your support to keep things running as the weather and time takes it's toll on the sites.

It's also important to remember that PCRN isn't a club in the normal sense. It reaps no money from hamfests (not that we do either, but that's another topic), and no means of support other than individual hams and K4ITL's pocket. Let's see if we can't help PCRN out a bit. If you know someone that's been a member in the past, encourage them to rejoin. If you know someone who isn't a member, tell them why they should join. Bookmark our web page and visit often for details about member status, news, etc. I'll do my best to keep the webpage updated and at least put new information and news up there monthly.

<http://www.ipass.net/~fallynch/w4fal/pcrn.html>

73, Frank W4FAL

To support PCRN, send a check to PCRN for \$15 per family, payable to:

PCRN
P.O. Box 12734
Raleigh, NC 27605

These numbers have increased a bit - several RARS members joined PCRN after this message appeared on the RARS e-mail list... thanks!

New 6-Meter Repeater in Wilmington

Hello Hams,

Leon KF4PAK

Rick KD4JRX told me this morning that there is a new repeater on six meters. It is up 580 feet, and is 11 miles west of Wilmington. The frequency is 53.430 with a tone of 88.5 that they can turn off when the band is open to enjoy some long distance contacts.

It is an open repeater so give it a try and let's see what kind of range it has. I don't have a six meter transmitter right now, so am only listening on my scanner, but I receive it good here just southwest of Jacksonville.

Cary UHF Repeater Upgraded

Ronnie J. Casey K4JDR

The 444.775 repeater has been on the air for several years, originally built by Danny Musten KD4RAA. Last year, K4JDR took over the machine, and this year, he replaced it with all new equipment. Ron provides us with this update - KN4AQ

Well, the Cary 444.775+ 100 PL is up and running. Hopefully with minor tweaking it should be on GO. Thanks go to those who assisted me on its initial placement at the site.

Thought that I would send you some user codes for the repeater. Feel free to punch them in. I will be interested in any signal reports and notes on how you receive the signal from the repeater while you travel. I am running 18 Watts to the Antenna System and will probably increase it a little at the time until it balances out. The old repeater was doing about 22 Watts into a damaged antenna system. I will also tweak the squelch circuit from time to time.

444.775 Repeater User Codes:

- * 3 1 System Voltages and Squelch Level
- * 3 2 S-Meter (a 3 sec. TX before DTMF and a 1 sec. delay after)
- 5 6 Time
- * 4 5 6 Time and Temperature
- # 9 Force CW ID
- 7 7 7 7 Force Voice ID
- 8 4 4 3 Force for Fridays "T G I F"

The new machine is a Vertex Repeater, with a RI 310 Controller.
You can reach Ron at: K4JDR@juno.com ■

**Check Into the RARS
10 Meter Net
8:30 pm Wednesday
28.364 MHz USB**

FCC ULS Now Available Via Web

FCC Public Notice

To further the ability of applicants to file electronically, Universal Licensing System (ULS) filing via the Internet was implemented on April 29, 2000. Whenever ULS users choose to access ULS, they can now choose between accessing the ULS on the Internet, by going to the ULS home page www.fcc.gov/wtb/uls, or by utilizing the dial-up service to the Commission's Wide Area Network (WAN).

When an applicant reaches the ULS homepage, clicking on the "Online Filing" button takes the applicant to the filing service.

Software/System Requirements:

ULS software works with the Netscape Navigator browser. (The software requires the standard implementation of Java applets adopted by Netscape.) The following Netscape Communicator versions (specifically the Netscape Navigator browser included with these versions) are compatible with the ULS: 4.5, 4.51, 4.61, and 4.7x. The following versions are NOT compatible with the ULS: 4.6 and versions earlier than 4.05.

All ULS users will also want to have installed the Acrobat reader to read certain ULS documents.

For more information, check the ULS web page:

www.fcc.gov/wtb/uls

FCC Audits Washington NC VE Session, Questions Charlotte Bootlegger Suspect

ARRL Bulletin

WASHINGTON, NC: The FCC wrote Advanced licensee Leo C. Mallard Jr, W4KEM, Extra licensee Ronald J. Knapp, W9EF, and Advanced licensee Edward Gunter, N2VEA, all of Kinston, and Robert E. Jones, KQ4PK, of Dover, North Carolina, on April 26, as part of an audit of an ARRL-VEC examination session in which the four are listed as participating Volunteer Examiners. The session took place July 30, 1999, in Washington, North Carolina.

The ARRL-VEC alerted the FCC to possible discrepancies at the session. The audit focuses on Form 610 packages submitted for Technician licensees James L. Smith Jr, KG4EIA; Frances B. Freck, KG4EIB; and Charles R. Collins, KG4EIC. The FCC asked the VEs for specific information involving erasure marks, check marks (some of which appeared to have been erased) and circles drawn around correct answers on answer sheets for one or more applicants.

The FCC also asked each VE to state if he was present for the July 30 session; if the Form 610 was initialed or signed by him, and if not, whether he authorized anyone to apply the signature; and his involvement, if any, in the session.

CHERRYVILLE, NC: The FCC sent a Warning Notice on April 12, 2000, to Frank Mauney, citing FCC evidence alleging operation of radio transmitting equipment without a license on frequencies in the 2-meter band, including 145.350 MHz in the Charlotte, North Carolina, area. FCC Special Counsel for Amateur Radio Enforcement Riley Hollingsworth warned Mauney that operation of radio transmitting equipment without a license was a violation of federal law and could lead to fine, imprisonment, and seizure of equipment. He requested that Mauney contact him within 10 days to discuss the matter. ■

Fox Hunts Return to Triangle

Charles Scharlau NZØI

For the second time in 15 days a record was set for the number of transmitters in a North Carolina transmitter hunt. William B. Umstead State Park, between Raleigh and Durham, was the site for this Raleigh Amateur Radio Society event marking **National Foxhunt Weekend** on Sunday, April 16. (The first "warm-up" hunt was held on April 1st in Carrboro.) Observers and participants added up to fourteen individuals, easily outnumbering the six transmitters hidden in the park.



Fox Transmitter outside of its protective (and deceptive) bag

frequencies: 146.565 MHz and 146.500 MHz. A 30-second transmit period was used, so hunters needed to wait only one minute for a transmitter to come back on the air after completing its transmission.

The transmitters consisted of five Alinco DJ-S11 HT's with built-in antennas running 50 mW, and one crystal-type Wilson 1402SM HT with rubber ducky, running about 1.5 watts. Each transmitter was controlled by a Montreal Fox Controller, with customized software that allowed the transmit interval to be adjusted. The transmitters were placed in the park on the morning of the hunt, and individual travel alarm clock turn-on circuits activated them all simultaneously 15 minutes before the hunt started.



Fox Transmitter with ID card hangs from a tree in Umstead Park, awaiting hunters.

The format for this hunt was in some respects quite similar to an international-style Amateur Radio Direction Finding competition. Umstead Park is, in fact, large enough to host a genuine ARDF hunt. But for this hunt, the area was restricted to a region roughly 500 meters in diameter.

All the transmitters were placed within 20 meters of a foot path, so that no serious off-trail hiking was required. (Which is not to say that some hunters didn't take some serious off-trail hikes!)

The six transmitters were divided evenly among two different



Part of the "decoy field" - which bag contains the real transmitter? It takes some sharp radio skills to figure it out

for each transmitter's control mark they recorded on their score card. A point was deducted for any decoy transmitter control marks they recorded. The remaining four transmitters were located in wooded areas within the park, between 200 and 400 meters from the starting point.

Many participants were experiencing their first taste of on-foot transmitter hunting, and as the results show, everyone experienced the taste of victory over at least one transmitter.

Equipment used by the hunters ranged from body-fading, to a four-element log periodic beam. Most hunters favored the WB2HOL tape measure yagi and an offset attenuator. Tracking the third harmonic was a helpful technique for several hunters.

Individual results have been posted to the Piedmont Transmitter Tracking web site:

www.qsl.net/nz0i/

My sincere thanks and congratulations go to everyone who participated. Thanks also to the Backwoods Orienteering Klub, of Raleigh, NC, for providing custom orienteering maps for this event.

You can reach Charles by email at: nz0i@qsl.net



Jim Heinis WA4RCU and John Swartz KB1DLB take a bearing on the first transmitter. NZØI had several antenna/attenuator packages to loan to new hunters who didn't have their own equipment yet.

NEXT HUNT: Sunday, June 4th

The next hunt is sponsored by the Backwoods Orienteering Klub, at 12 noon, Saturday, June 4th. The hunt will start from Umstead's south entrance, at Harrison Ave. and I-40. This will probably be the last hunt until fall. Entry fee is \$4.



Matt Cooney, Chris Lawless, Jacob Holbrook and Rick Holbrook prepare for the April 16 hunt at Umstead Park. Chris won the "warm-up" hunt in Carboro on April 1st... his first hunt ever, and he didn't even have a ham license yet! Now he's KG4HNC. The winner for the April 16th hunt was Fred Decker N4IXL.



The hunts organized by NZØ1 are "International" style on-foot hunts with multiple transmitters. To add to the international flavor, one of the hunters (left) was Chris Petrich, an NCSU student from Germany. Chris is now KG4HJM. When he returns to Germany, he'll have to take another test to get his DL license - most countries (including the USA) don't let you operate from home using a "reciporical" license from a foreign country.

Also visiting the hunt was Dave Humphries G4ETG from England (above). Dave was in town on business. The night he checked in to the 146.64 8:00 net, two other visiting Brits also checked in! We're becoming a regular UN tour bus stop!



Chris is also featured on the cover of this issue, adjusting his radio to UHF to listen to the 3rd harmonic of the Fox's signal as he closes in on the hidden transmitter.

Solving The Signal-Overload Problem

One of the bigger problems fox hunters face

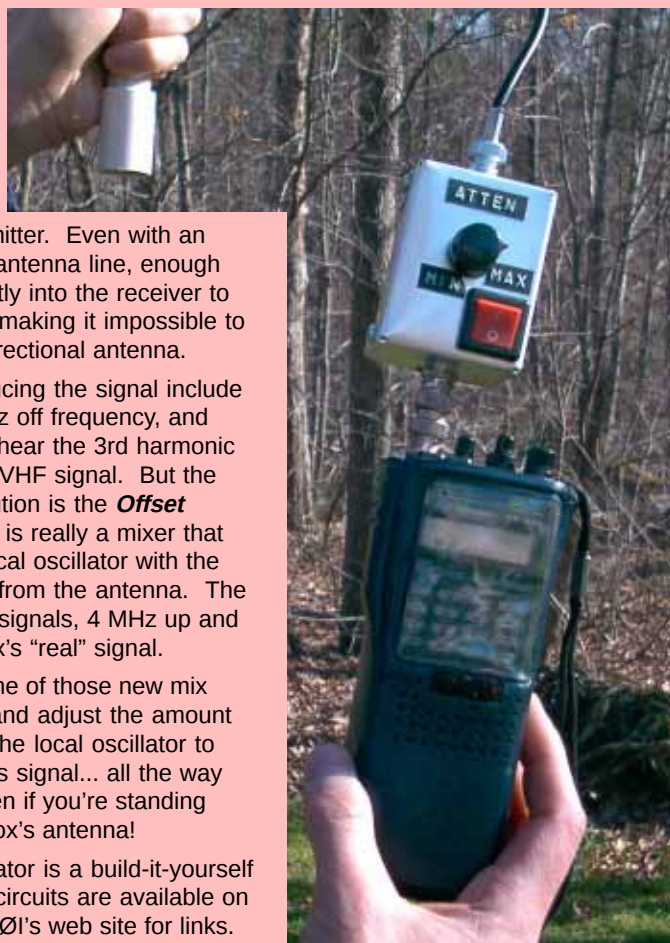
is signal overload once they get close to

the hidden transmitter. Even with an attenuator in the antenna line, enough signal leaks directly into the receiver to peg the S-Meter, making it impossible to get a fix with a directional antenna.

Solutions for reducing the signal include tuning 5 or 10 kHz off frequency, and tuning to UHF to hear the 3rd harmonic of a really strong VHF signal. But the most elegant solution is the **Offset Attenuator**. This is really a mixer that beats a 4 MHz local oscillator with the incoming signals from the antenna. The result is two new signals, 4 MHz up and down from the fox's "real" signal.

Tune the HT to one of those new mix product signals, and adjust the amount of injection from the local oscillator to attenuate the fox's signal... all the way down to zero, even if you're standing right next to the fox's antenna!

The offset attenuator is a build-it-yourself project. Several circuits are available on the web. See NZØ1's web site for links.



Batteries In The Hamshack – Part 3

Jeff Wittich AC4ZO

Charging and Chemistry

Last month, we looked at some of the things that can go wrong with a battery, and a few of the failures could be traced to improper charging and maintenance. I get asked a lot of questions about the care and feeding of lead acid batteries, so here's the answers I give.

First a word about discharge. The amp hour capacity of a battery is a measurement of how long the battery will last under various discharge rates. A 7 amp hour battery can supply an amp of current for about 7 hours. Can it also supply 7 amps of current for one hour? Well, no. The capacity stated is accurate when the battery is discharged over some specified period of time, usually 5 or 8 hours for traction batteries. So in the example above, the 1 amp figure fits into the recommended discharge rate, but the 7 amp figure does not. Common sense tells us that if we increase the current drain, the time will decrease, but it's not a 1 to 1 relationship. If we double the current, we do not get half the discharge time, but rather less than half. And each type of battery has a voltage at which it is considered to be discharged, and discharging below this voltage seriously shortens the life of the battery. Unless you have a battery of some specialized construction, consider full discharge to be 1.75 volts per cell, or 10.5 volts for a 12 volt battery. That will be safe enough for our purposes.

Lead acid batteries should not be allowed to sit around in an uncharged state. When they are discharged, a layer of crystalline lead sulfate forms on the plates, and the longer they are allowed to stay there, the greater the likelihood that they will not dissolve when the cell is charged. This increases the internal resistance of the cell, reducing its performance. If you need to store a battery for an extended period of time, there are chargers available at K-Mart and Wal-Mart for about \$25 or so that can be left on the battery indefinitely. They are intended for use on seasonal stuff, like snowmobiles and lawnmowers. They would normally be used during the thing's "off" season, ensuring a good battery when the device is called into service.

A lead acid battery is best kept with a voltage applied to it whenever it is not being used. This is called "float" service, and is how batteries in commercial radio and telephone installations are maintained. If your batteries are supplying the DC distribution system in your hamshack, you can just parallel them on the power supply, if the power supply has some means of limiting its current to prevent self destruction. This arrangement is called "standby service" and it presents some special problems. Since so few people are doing this, I'll skip it for now and cover it if anyone asks about it, ok?

So, when we take a battery out to a public service event, and power the radio, and maybe an amplified speaker for the day, then bring it home and charge it, that's called **cyclic use**. The type of batteries we normally have access to (traction batteries) are very well suited to this application. This includes the 7 and 24 amp hour units commonly available at hamfests.

Now, when it's time to recharge the battery, few of us have the means to accurately control the charging process... we just connect up whatever charger we have and live with it. But there is indeed a "best" voltage and current to use.

We normally want to charge the battery to 2.25 volts per cell. For a 12 volt battery, this would be 13.5 volts. If the battery is not to be used outside on hot summer days, most can take 13.8 volts, or 2.3 volts per cell. A power supply set to this voltage will work as a charger, but the battery will draw a lot of current for the first few minutes.

The charging current can (and should) be limited. Perhaps the simplest way to do this is to make a limiting device out of a number 1157 automobile lamp, available from K-Mart. This lamp has another useful purpose I'll tell you about in a minute. Just "connectorize" the bulb so that it can be inserted in series with the battery and power supply. Begin charging, and you will notice that the current drawn by the battery will initially be high, but will quickly reduce. You can see this by the initial glow of the lamp, which quickly reduces in intensity. After a few minutes, you can try removing the light bulb, and see if the power supply can handle the load. *In any case, do not let the battery charging current go above C/10, that is, one tenth of its amp hour rating.* For a 7 amp hour battery, that would be a little less than 1 amp. In time, the battery current will drop to a level of just a few milliamperes, where it can stay indefinitely. If you remove the battery from the power supply and the voltage reads 13.3 volts or more, it's a good indication that the battery is fully charged. The voltage will eventually drop to about 13.0 if left off the power supply, and this is no cause for concern. I only mention it to show that the voltage must be measured quickly upon removal from the power supply for this test.

Some power supplies are programmable, and can have the maximum current limited to some level. This would make an ideal charger. Set the voltage to 13.5 (or 13.8) volts, and limit the current to C/10. When the battery is placed on charge, the power supply goes into "current limit" mode, and the voltage will read something below 13.5. As the battery charges, the voltage will rise until it reaches the preset charge voltage, and then the current will begin dropping off. The current continues to reduce as the battery charges.

Since these fancy programmable supplies are out of the reach of most of us, here's the simplest way to construct your own lead acid battery 12 hour "taper" charger: Start with a power supply that can supply C/5. That's a current capacity of one fifth the amp hour rating of the battery. Set the voltage to 2.8 volts per cell (16.8 for a 12 volt battery) and connect an 1157 lamp in series with the output. Connect the battery, and check for a charging current of between C/10- and C/5. If the charge current is too low, add another bulb in parallel with the first. It's unlikely that the current will be too high. When the voltage on the battery reaches 2.7 volts per cell (16.2 for 12 volt batteries), charging is complete and should be stopped. Continued charging beyond this point will damage the battery. With a little trial and error, the proper number of 1157 lamps can be determined such that charging takes about 12 hours, for a fully discharged battery. This is the figure you want. Of course, there will be a different number of lamps for each battery size. Larger batteries require more lamps in parallel, since they require more charge and can take more current.

The 1157 lamp has another useful purpose. It can be used to measure the capacity of a battery whose condition is unknown. The lamp has two filaments in it. When connected in parallel and connected to 12 volts, the lamp draws about 2 amps. It should discharge a 7 amp hour battery in about 3 hours. The time is derated because we are exceeding the 5 hour discharge

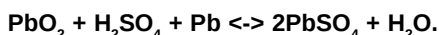
CONTINUED..... next page

BATTERIES continued from previous page

rate. For larger batteries, any number of 1157 lamps can be connected in parallel. If the lamp lights brightly for only a few seconds and then stays dimly lit, the battery has a high internal resistance and is near the end of its life, even though it may read 12 volts or more on a volt meter. That's because the volt meter takes its reading without placing any appreciable load on the battery. A fully charged battery in good shape will read 12 volts on the meter *with* the 1157 lamp connected.

Just in case anyone is interested, here's the simplified chemistry that goes on in the jar that makes the whole thing work. There are 3 active components here. An **electrolyte** of sulfuric acid (H_2SO_4), **negative plates** of sponge lead (Pb), and **positive plates** of lead dioxide (PbO_2).

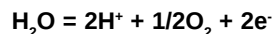
As the battery is being used (discharged), the positive active material (PbO_2) and the negative active material (Pb) react with the sulfuric acid (H_2SO_4) forming lead sulfate (PbSO_4) on both plates, and converting the acid to water (H_2O). Its chemical formula looks like this:



If you add up all the Pb's and H_2 's and stuff, you'll see that there

are the same number of each on both sides of the equation. The bi-directional arrow indicates that the reaction is reversible, and indeed it is. That's what makes them rechargeable. On charge, lead sulfate is changed to lead dioxide on the positive plate and sponge lead on the negative plate. At the same time, the concentration of sulfuric acid is restored.

During charging, an additional reaction takes place as the battery approaches full charge. Often, excess energy is forced through the cell, causing water to electrolyze (separate) into hydrogen and oxygen gasses, which escape. Here is the reaction at the positive plate:



and at the negative plate it is:



This gas generation means loss of water. For a flooded cell, it's no problem... just add water. But for VRLA batteries like we often use, it means serious shortening of life. The more the overcharge, the worse the damage. And the water loss is predictable. Each cell will lose .03 ounces per cell for each amp hour of overcharge. For a 12 volt battery (6 cells) it works out to .18 ounces per amp hour of overcharge.

Next month: *Nicads*

Field Day continued from page 3

get to the site for a visit. But don't be surprised if you fall into the excitement and don't make it home before sunrise the next morning!

Setup will begin at 2:00pm on Friday, June 23. Operating starts at 2:00pm on Saturday and continues for 24 hours. Camping equipment can be set up even before this, but please, no station equipment until 2:00.

Food is in the capable hands of WØUCE. It will be up to him whether or not a Club picnic type event will accompany this year's operation. Some years it has, some it hasn't.

Field Day Commemorative Pins (like the one pictured on the cover) are again being offered by Headquarters. I will have one there to look at. If you want one of your very own, the cost is once again \$5 and I will need to have it before you leave the site that weekend.

Directions: Take US1/64 west from Raleigh until US1 and 64 split just past Cary Parkway. Take the US1 side, and go to New Hill-Holleman Rd (6 miles past NC route 55). There is a sign that says Jordan Lake. Turn left at the top of the ramp, and go about 1000 feet. Just past the ramp going back onto US1 will be **Friendship Road** going only to the left. Take the left, and go 1 mile. The address is 4501 Friendship Road.

I think that about covers it for now. If you have any questions or comments, either ask away on the rars-I or give me a call at 362-9456. See you there! ■



WØUCE will be the Chef at Field Day... Remember this concoction he brewed up at the 40 cw station last year? One of the formulas in Jeff's *Battery* article above probably applies.

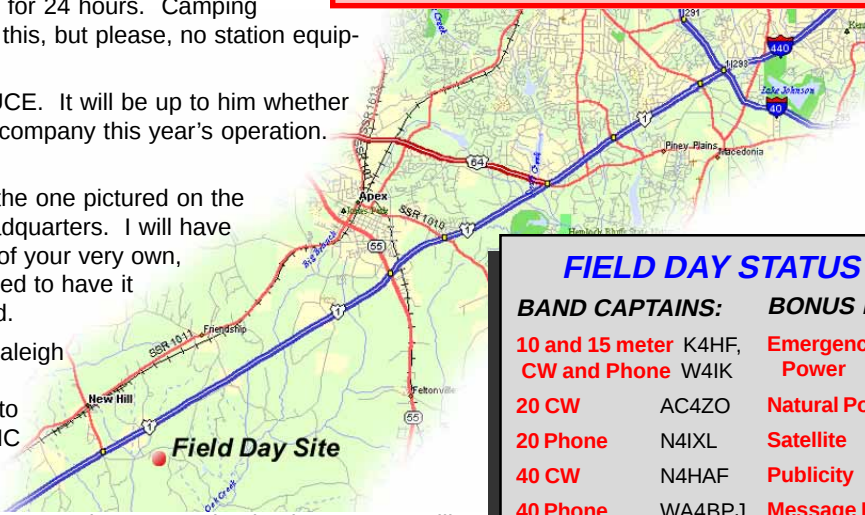
You might want to revisit the pictures from our 99 operation on the RARS web site: www.rars.org

Public Service Calendar

May 27: Run for Research - RTP (Glaxo)

June 2-4: NC Special Olympics Summer Games

September 16/17: MS-150 Bike Tour



FIELD DAY STATUS BOARD

BAND CAPTAINS:

10 and 15 meter K4HF,
CW and Phone W4IK

20 CW AC4ZO

20 Phone N4IXL

40 CW N4HAF

40 Phone WA4BPJ

80 CW (OPEN)

80 Phone KN4AQ

Digital (OPEN)

Novice/Tech W2BYV

VHF N1GMV

BONUS POINTS:

Emergency Power ALL

Natural Power (OPEN)

Satellite (OPEN)

Publicity KC4WUH

Message Relay KG4CXY

Message to Section Manager KG4CXY

W1AW Message (OPEN)

APRS Demo W2BYV

OTHER IMPORTANT STUFF:

Chef WØUCE, asst. by KF4HQS

KG4FIO can provide a 10KVA generator for anyone that needs it. W4KGL will be available to help with setup for anyone who needs it. He also has a large quantity of military antenna wire.

HAMFEST SOCIAL SPECIAL THANKS

I want to say thanks

to everyone who worked to

make the HAMFEST SOCIAL so special this year. More food was brought to the event than was expected and for this, all those who partook were especially joyful (and full!). Many thanks to all who gave so generously. I know many of you and what you brought and you are truly thanked; however, there was much that appeared and I do not know who to thank....you know who you are, though, and so I especially want you to know that your efforts very much were appreciated.

Thanks, too, for all the help given by so many to set up for the event, for serving and keeping food lines moving, and for clean up. Club member Larry Carringer provided background music that added a nice touch to the evening. I heard many appreciative comments about Larry's musical presentations, so I want to thank him for his talented contribution to an enjoyable event.

My daughter, Jennifer Zech, helped with the planning and all that went on before the actual day of the Social. I want her to know that it was fun and a special mother-daughter time for me.

*Mary Jo Littlewood
XYL/K4HF*



*Ginger KD4OKP and Mary Joe Littlewood smile for the camera. This picture was obviously taken **before** the Social!*

If anyone has suggestions for how to improve the next Hamfest Social, I would welcome them. I will be sure they are passed along to the person who will handle the social next year. E-mail comments to c.littlewood@att.net ■

More Snapshots from the RARSfest



Homecoming: Doug AD4UL retired and left the area several years ago. But he keeps coming back to enjoy (and work his tail off at) the RARSfest! Thanks, Dougie!! Hamfest Chair Cyndi KD4ACW feels a wave of relief once she hears Doug ID on the repeater before the fest. Now, Doug, about the State Fair.... the MS-150... the Special O



Hall Monitors: Jim and Denyse Walter (KG4FIJ and KG4CXR) proudly display their Security Badges as they keep an eye on the goodies Saturday night.



Would You Buy A Hamfest Ticket From This Man? Several hundred people did! Mike KC4WUH jumped in to help out anywhere we needed assistance, from ticket sales to security. Thanks, Mike!



Talk Show Hosts: Bruce KC4UQN filled in as Talk-In Chair for David Fix, who was called away just before the fest. David KD4WQU helps Cousin Brucie with the road show



The Way To A Ham's Heart: Thanks to the RARS Crystals (above) and the Murphy family (left) for keeping us well fed and happy at the Social.



Club Meeting Minutes

May, 2000

Minutes of the Regular May RARS Meeting - May 2, 2000

The regular meeting of the Raleigh Amateur Radio Society was held on May 2, 2000 at the Forest Hills Baptist Church on Clark Avenue.

The meeting was called to order at 7:32p by President Jack Ritter, WØUCE, who welcomed 51 members and 8 guests.

David, N4YTO gave the Treasurer's report. He said that our membership stands at 288, and we are approaching the renewal season.

Jeff AC4ZO conducted the hamfest incentive prize drawing. The security prize went to Ron Ford, KG4FJA; and the hamfest worker prize was won by Hank Montgomery, K4HM.

Joe, WA2UZO announced an upcoming public service event to be held at Glaxo Wellcome on May 27. He is seeking volunteers to work the event.

With that completing the announcements, Jack commented on the telegraph equipment which had been brought and placed on display, and then introduced the Speaker for the evening, Jeff AC4ZO. The program was "The Invention Of The Telegraph."

After the presentation, questions were taken from the membership concerning Field Day.

Door prizes went to N1GMV, KG4BDX, AB4OZ, W2JNW, KE4DOX, K4DAM, KE4JKD, WA4BPJ, and WA2UZO.

The meeting adjourned at 9:05p.

Jeff Wittich AC4ZO, Secretary

Articles, Authors Wanted

We're looking for authors, always. If you want to write, but aren't sure what, I've got some topics to suggest:

"My Favorite Band" - what band do you operate the most? What's the attraction? What's the propagation like? Any special inhabitants, activities?

Magazine Reviews - Of course, the big ones (*QST*, *CQ*, *73*?), the medium ones (*WorldRadio*), the regional ones (*SERA Journal*), the specialties (*QEX*, *NCJ*, *ATV*?). You see, there's a lot out there. Maybe you read one that others would be interested in.

"Meet the members" - Profiles of RARS members. Have a friend in RARS? Write a brief bio on him/her for the *Exciter*.

Radio Reviews - We've seen some good ones, but you don't have to be elaborate or have a bench full of test equipment. Just a new radio, and your impressions of it.

Pictures - Ikon does a great job of reproducing the pictures, and each one is worth 1000 words, of course.

The *Exciter* is another way to share your enjoyment of ham radio with other local hams. Let's keep it coming!

Board Meeting Minutes

April, 2000

Minutes of the RARS April Board Meeting - April 18, 2000

The monthly Board meeting of the Raleigh Amateur Radio Society was held at the Forest Hills Baptist Church on April 18. The meeting was called to order by Vice President Tim Nicholson KF4RTX at 7:44p. Members present at that time were: KN4AQ, KG4CXR, K4HF, N4IXL, KF4RDP, WD4RDT, KF4RTX, N4YRD, and AC4ZO. The total attendance was 11.

On motion by KN4AQ, seconded by K4HF, the minutes of the March meeting were approved.

KF4RTX gave the VP report. The topic for the May meeting will be The Invention of the Telegraph; June will be a video of Reily Hollingsworth from the hamfest.

Committee Reports:

In the FM Committee report, N4IXL said that 444.525 is down, and there is maintenance going on for several RARS repeaters. Also, we have secured an RTP site for 145.13, and a delegation will evaluate the site soon.

KN4AQ reported on the Education Department. He said that he is planning on starting a class the week after the Fourth of July week. Course materials were discussed.

KN4AQ, now reporting on the Exciter said he has received lots of material, so this month's edition will be 12 pages instead of the customary 8. A printed copy was circulated. We will attempt bulk mailing for the May issue.

In the Webmaster report, KF4RDP said that page usage is increasing, and everything is running smoothly.

KF4RTX gave the Hamfest report. He said that everybody had a good time, and things ran exceptionally smoothly. The post-mortem meeting has occurred, and the final accounting is expected in next week. K4HF read a letter of appreciation he had received from The Sign Man of Baton Rouge. Also, he reported that there were lots of favorable comments from vendors.

Unfinished Business:

An item concerning the policy for the acquisition of assets was brought up. It has been carried over since January, but has still not been heard. The Secretary was directed to remove the item from the agenda.

The issue of Club Bylaws was heard once again. AC4ZO explained the current situation and presented a plan whereby we would file an amended Articles of Incorporation, and then adopt our old bylaws again. There was a lot of discussion, and the resolution the resulted was that AC4ZO would make a few specified changes to the original proposal, and send the resultant

file to N4IXL for discussion with our CPA before filing with the office of the Secretary of State. The bylaws will then be handled at a future meeting.

KN4AQ related that he has been attempting to call a summit of the leaders of local clubs to discuss the state of ARES, but there's been little interest so far.

New Business:

An item was heard regarding problems with the distribution of RARS membership cards. After a short discussion, KG4CXR in Membership Services was authorized to mail the cards.

K4HF brought an item to the Board about door prizes for Club meetings. On motion by AC4ZO, seconded by N4YRD, the door prize advancement fund was adjusted from \$200 to \$290.

At this point, the Action Register was reviewed. Several items were closed, and 2 items were added. The current register is always on File in the Secretary's office.

Announcements and Board Member Comments:

N4IXL would like us to organize a means of soliciting donation from area corporations. KF4RTX commended the Board on the actions concerning the bylaws.

With the business complete, on motion by AC4ZO, seconded by KD4ACW, the meeting adjourned at 9:33p.

Respectfully submitted, Jeff Wittich AC4ZO, Secretary

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SWL/Scanner Report

Kelly Mills AE4FG

The May meeting of the Scanner/SWL SIG was held on the 15th at the El Rodeo restaurant on Pleasant Valley Road in Raleigh. Fourteen people attended.

Bill Cole, KG4CXY, gave a presentation on HF utility monitoring. Topics included: air traffic control, military, US Coast Guard and marine, and spy station monitoring.

The group also discussed upcoming events such as our shortwave monitoring day at Jordan Lake on May 20th, a tour of the NC Highway Patrol dispatch center in July, visiting the Voice of America in Greenville, NC, and a possible visit to the NC DOT highway camera center. The meeting adjourned at 9:00.

The June meeting will be held on the 19th (third Monday). Mike Guzzo from Wake County Search and Rescue will give a presentation to the group. Join us at 6:30 for a meal at El Rodeo. The meeting will begin at 7:30.

The Scanner/SWL net is now being held each Monday night at 9:00 on the 146.64 repeater. Be sure to stop by and let us know what you have been monitoring.

For more information, e-mail Bob Zeher (ke4jvy@juno.com) or Kelly Mills (ae4fg@hotmail.com), or call Bob at 844-9757.

Hamfest Calendar

May 27: DurHAMfest - Durham

June 4: Manassas, VA

June 10: Winston-Salem

July 8: Salisbury

July 15: Cary



courtesy of the
SERA Repeater Journal

RARS Tech License Class Scheduled for Summer

Now that the FCC License Restructuring is settling down, we're planning the next RARS Tech License Class for this summer. The Winter class was cancelled because it would have ended just days before the April 15 Restructuring changes.

The *tentative* schedule for the next RARS Tech license class will be to begin on Monday, July 10th. We will then follow the usual schedule, holding class on Monday and Thursday evenings for 6 weeks. Classes are held at the Nortel Technical Education Center, just off Rt. 54 near I-40, west of the Fairgrounds.

We're hoping some teens and younger kids will be able to attend. These students have trouble fitting ham classes in with their regular schoolwork during the school year.

Check the RARS web site for updated class info, or contact Gary KN4AQ at: kn4aq@arri.net, or 380-9944.